the following excesses: Florida Peninsula, 0.20; west Gulf, 0.50; North Dakota, 0.60; southern Slope (Abilene), 0.50; southern Plateau, 0.20; middle Plateau, 1.00; north Pacific, 3.50; middle Pacific, 2.50; southern Pacific, 0.40. The deficits are as follows: New England, 2.40; middle Atlantic, 1.90; south Atlantic, 1.10; east Gulf, 1.70; Ohio Valley and Tennessee, 2.60; lower Lake, 0.80; upper Lake, 0.50; upper Mississippi, 0.80; Missouri Valley, 0.50; northern Slope, 0.10; middle Slope, 0.50; northern Plateau, 0.20.

Details as to *excessive precipitation* are given in Tables XII and XIII.

The hourly distribution of precipitation is not now tabulated.

The *total monthly snowfall* at each station is given in Table II. Its geographical distribution is shown on Chart No. VI. The limit of freezing temperatures and possible snow is shown on the same chart by the isotherm of minimum 32°. The southern limit of frost in exposed localities is approximately shown by the isotherm of minimum 40°, within the thermometer shelter.

The depth of snow on the ground at the close of the month is shown on Chart VII.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 21, 22, 23. Arizona, 28, 29. Arkansas, 13. California, 17, 19, 20, 28, 29, 30. Florida, 22. Georgia, 21, 23. Louisiana, 21, 22, 25. Nevada, 21, 28. New Mexico, 29. North Carolina, 13. South Carolina, 23, 24. Tennessee, 23. Texas, 25, 30. Utah, 21.

SLEET.

The following are the dates on which sleet fell in the respective States:

Arkansas, 15, 23, 25. Colorado, 16, 22. Connecticut, 12, 24. Delaware, 31. Georgia, 7, 16, 23. Idaho, 1, 8, 15, 16, 17, 20 to 23, 29. Illinois, 10, 11, 16, 19, 21 to 24. Indiana, 19, 22, 23, 24. Iowa, 15, 17, 18, 19, 22, 23, 30, 31. Kansas, 14, 15, 16, 18, 30, 31. Kentucky, 10, 11, 16, 27. Louisiana, 6, 21. Maine, 3, 24, 25. Maryland, 9, 10, 19, 22, 23, 24. Massachusetts, 12, 22 to 25. Michigan, 9, 18, 22 to 25, 31. Minnesota, 6, 9, 10, 11, 15, 17, 19, 21, 23, 27 to 31. Mississippi, 15, 24, 25. Missouri, 15, 19, 20, 22 to 25. Montana, 10, 21. Nebraska, 14 to 19, 21, 22, 24, 29, 30, 31. Nevada, 13, 17, 21, 23, 25, 28. New Hampshire, 24, 25. New Jersey, 3, 7, 9, 24. New Mexico, 1, 26, 27. New York, 3, 18, 19, 23 to 26, 29, 30, 31. North Carolina, 7, 15, 16. North Dakota, 9, 11, 21, 30. Ohio, 3, 9, 14, 18, 19, 22, 23, 24. Oregon, 1, 16, 17, 18, 23. Pennsylvania, 3, 19, 22 to 26, 31. South Carolina, 15, 16. South Dakota, 15, 16, 21 to 24, 28 to 31. Tennessee, 7, 13, 23, 24. Texas, 28, 29, 30. Utah, 29. Virginia, 7, 8, 23. Washington, 1, 4, 8, 13 to 18, 23, 24, 25, 27. West Virginia, 3, 4, 5, 9, 21, 22, 23. Wisconsin, 10, 18, 20, 22, 23, 24.

WIND.

The *prevailing winds* for January, 1896, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The *resultant winds*, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart IV, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

The *diurnal variation* in the velocity of the wind is shown in Table VII, which gives the total movement for each hour of seventy-fifth meridian time, as deduced from self-registering anemometers at about 136 stations.

HIGH WINDS.

Maximum wind velocities of 50 miles or more per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				*Miles*	
Block Island, R. I	10	54	ne.	Fort Canby, Wash	26	72	s.
Do	24	66	e.	Do	27	55	sw.
Cheyenne, Wyo	1	56	w.	Do	31	66	se
Denver, Colo	1	66	sw.	Landen, Wyo	1	50	w.
Do	2	54	nw.	Moorhead, Minn	21	53	se.
Eastport, Me	25	50	ne.	Tatoosh Island, Wash	5	53	s.
Fort Canby, Wash	5	72	s.	Do	6	54	se.
Do	6	60	se.	Do	7	60	se.
Do	7	70	s.	Do	16	59	e.
Do	8	61	s.	Do	17	52	e.
Do	16	59	se.	Do	25	52	s.
Do	19	60	s.	Do	26	50	s.
Do	20	66	s.	Winnemucca, Nev	18	52	sw.
Do	24	54	e.	Do	21	54	sw.
Do	25	73	s.	Woods Hole, Mass	4	53	nw.

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 16 regular stations of the Weather Bureau by its photographic, and at 21 by its thermal effects. At one station records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric sheets show seventy-fifth meridian time; for convenience the results are all given in Table XI for each hour of local mean time.

Photographic and thermometric registers give the duration of that intensity of sunshine which suffices to make a record, and, therefore, they generally fail to record for a short time after sunrise and before sunset, because, even in a cloudless sky, the solar rays are then too feeble to affect the self-registers. If, therefore, such records are to be used for determining the amount of cloudiness, they must be supplemented by special observations of the sky near the sun at these times. The duration of clear sky thus specially determined constitutes the so-called twilight correction (more properly a low-sun correction), and when this has been applied, as has been done in preparing Table XI, there results a complete record of clear sky from sunrise to sunset in the neighborhood of the sun. The twilight correction is not needed when the self-registers are used for ascertaining the duration of a special intensity of sunshine, but is necessary when the duration of cloudiness is alone desired, as is usually the case.

The cloudiness is determined by numerous personal observations at all stations during the daytime, and is given in the column of "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table XI.

COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *duration* of effective sunshine whence the duration relative to that of possible sunshine is derived; the observer's personal estimates give the percentage of *area* of clear sky. These numbers have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentages of duration of sunshine is almost always larger than the observers' personal estimate of percentages of area of clear